

Imaging Spectrometry and Forest Fire Management

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The Airborne Visible/infrared Imaging Spectrometer (AVIRIS) measures upwelling spectral radiance from 380 to 2500 nm sampled contiguously at 10 nm intervals. Spectra are collected as images with 11 km width and up to 100 km length with 20 by 20 meter spatial sampling.

AVIRIS data have been used to investigate the following factors in forest fire management:

- 1) Vegetation species type
- 2) Vegetation biomass
- 3) Vegetation wetness
- 4) Vegetation canopy structure
- 5) Active forest fire temperature distribution
- 6) Active forest fire combustion processes
- 7) Active forest fire smoke penetration

This paper presents the physics and chemistry of the spectral signatures of the forest fire factors listed above. AVIRIS derived parameters for these factors are shown for a study areas in the Santa Monica Mountains, CA and for active forest fires in California. The connections between these spectrally derived parameters and decisions in precursor and active forest fire management are presented.